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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
KIM, YOUNG J	

ART UNIT	PAPER NUMBER
1637	

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,776	SU ET AL.	
	Examiner	Art Unit	
	Young J. Kim	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) *11-30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 31-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/7/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

S.O.O.

DETAILED ACTION

Election/Restrictions

Applicant's election of Group I, claims 1-14 and 31-33; and species (i) – magnetic counterbalancing (claim 10) – in the reply filed on April 15, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 15-30 (Group II) and claims 11-14 (non-elected species (ii) and (iii)) are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on April 15, 2005.

Applicants are advised that the elected group, Group I is drawn to a method, and therefore, the rejoinder right under *In re Ochiai* is no longer applicable.

Claims 1-10 and 31-33 are under prosecution therefore.

Information Disclosure Statement

The IDS received on September 7, 2004 is acknowledged.

A signed copy of the PTO-1449 is attached hereto.

Drawings

The drawings filed on September 22, 2003 are acceptable.

Specification

The specification is objected to by the Examiner because it makes reference to an URL on the internet. For example, section [0023] of page 6; section [0033] of page 10, contain web-address. While information on web-address is accessible, the embedded hyperlinks and/or other

forms of browser-executable code are impermissible and require deletion. The attempt to incorporate subject matter into the patent application by reference to a hyperlink and/or other forms of browser-executable code is considered to be an improper incorporation by reference. See MPEP 608.01(p), paragraph I regarding incorporation by reference.

If the subject matter which is improperly incorporated by reference is directed to nonessential material (illustrating the state of the art), the deletion will probably not be considered as new matter. However, if the subject matter which is improperly incorporated by reference is directed to essential material, applicant will be required to amend the specification to include the subject matter incorporated. The amendment must be accompanied by an affidavit or declaration executed by the applicant stating that the amendatory material consists of the same material incorporated by reference.

Applicants are requested to peruse the specification to remove any active hyperlinks present in the application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-10 and 31-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 and 31 are indefinite for failing to recite a final process step which agrees back with the preamble. While minor details are not required in method/process claims, at least the basic steps must be recited in a positive, active fashion. See *Ex parte Elrich*, 3 USPQ2d, p. 1011

(Bd. Pat App. Int. 1986). For example, Claims 1 and 31 are drawn to a method of *detecting and/or identifying* analytes, yet the claims recite a final step of, "imposing a counterbalancing force to restore the cantilever to its original position. The claims do not set forth the conditions/state when the method has been completed [i.e., needs to agree with preamble].

Claims 2-20, 32, and 33 are indefinite by way of their dependency on claims 1 and 31.

Claims 1-10 and 31-33 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The claims are drawn to a method of detecting and/or identifying analytes. The critical method steps involved are drawn to deflection of cantilevers ***and*** imposing of a counterbalancing force to restore the cantilever to its original position. However, there is a disconnect in how the counterbalancing step which restores the cantilever to its original position is related to detecting and/or identifying analytes as the preamble of the method requires.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9 and 31-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Thundat (U.S. Patent No. 6,016,686, issued January 25, 2000) as evidenced by Cima et al. (US 2002/0048610 A1, April 25, 2002, filed January 8, 2001).

Thundat discloses a method of detecting an analyte from a sample via use of an apparatus comprising: a) at least one cantilever (Figure 1); b) at least one probe attached to said cantilever, wherein said probes are disclosed as being enzymes, peptides, nucleic acids, antibody, etc. (column 7, lines 1-10); c) a first electrode and a second electrode (column 6, lines 33-40); and a DC power supply (column 6, line 40).

With regard to the target analytes having a net electrical charge, the embodiment drawn to nucleic acid detection of Thundat et al., would render anticipated as nucleic acid molecules are known to have negatively charged backbones.

The detection of molecular interaction is determined from the stressed produced on the cantilever, resulting in its bending (or deflection) (column 4, lines 64-65), wherein said deflection is detected by photosensitive detector (column 5, lines 41-45).

Thundat discloses that other means of detection are also included, wherein said detection methods include, "interferometric, capacitance, piezoresistance, electronic tunneling, or piezoelectric" detection methods (column 5, lines 10-14).

In an embodiment of the cantilever of Thundat, the cantilever is disclosed as having a second coating on the second side of the cantilever, allowing accumulation of a different surface charge than that produced by the first side of the cantilever (column 4, lines 45-55).

Thundat discloses that a plurality of cantilevers can be made into an array, the plurality of cantilevers reacting with differing biomaterials, evidencing the presence of different biomolecules (such as nucleic acids) on the cantilevers (column 8, lines 57-65)

The raw data are disclosed as being processed through an integrated microprocessor, utilizing preprogrammed analysis (column 8, lines 64-66).

In addition to the photodetection of cantilever deflection, the artisans also disclose that other means of detecting the deflections are employed, such as piezoresistive, piezoelectric, capacitive, and electron tunneling, "all of which are conventionally known" (column 9, lines 35-38). For example, piezoelectric detection is known in the art as detecting the deflection of a cantilever wherein feedback mechanism is employed to ***maintain the tip of the cantilever at a constant force or constant height*** (or neutral position) [0257, Cima *et al.*].

Hence, the ***feedback mechanism*** which allows the cantilever tip to be maintained at a constant height (or neutral position) would necessarily require a control system operably connected to the detection unit.

Thundat discloses that the probes of the cantilever are enzymes, peptides, nucleic acids, antibody, etc. (column 7, lines 1-10).

Therefore, Thundat anticipates the invention as claimed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thundat (U.S. Patent No. 6,016,686, issued January 25, 2000) in view of Binning et al.[1] (U.S. Patent No. 6,079,255, issued June 27, 2000).

Thundat discloses an apparatus comprising: a) at least one cantilever (Figure 1); b) at least one probe attached to said cantilever, wherein said probes are disclosed as being enzymes, peptides, nucleic acids, antibody, etc. (column 7, lines 1-10); c) a first electrode and a second electrode (column 6, lines 33-40); and a DC power supply (column 6, line 40).

Thundat discloses that other means of detection are also included, wherein said detection methods include, "interferometric, capacitance, piezoresistance, electronic tunneling, or piezoelectric" detection methods (column 5, lines 10-14).

Thundat does not explicitly disclose that counterbalancing force is magnetic.

With regard to the cantilever comprising an magnetic counterbalancing, Binning et al. discusses a well-known actuators such as piezoceramic (or piezoelectric) actuators (column 5, lines 15-16) and magnetic induction/magneticmotive force (column 5, lines 39-48), teaching instant claim 10.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Thundat with the teachings of Binning et al. to arrive at the claimed invention for the following reasons.

Binning et al. disclose that among many forms of detection methods, such as piezoelectronic, piezoresistance, and magnetomotive forms, demonstrating that different forms

[1] Cited by Applicants in the IDS received on September 7, 2004.

of cantilever deflection detection methods have been well-established in the art (column 6, lines 63-67):

"Both detection approaches [optical or piezoresistive methods] can be applied to the present invention." (column 7, lines 4-5, Binning et al.).

Since the cantilever deflection method employed by Thundat also employs optical as well as piezoresistive methods, one of ordinary skill in the art would have clearly recognized that other forms of well-known cantilever deflection detection method would have been easily incorporated into their methods, such as magneticmotive/magnetic induction detection method disclosed by Binning et al.

Provided that Binning et al. explicitly disclose various detection methods that could be applied to the cantilever apparatus, as well as Thundat, one of ordinary skill in the art at the time the invention was made would have had a reasonable expectation of the success at the modifying the teachings of Binning et al. with the teachings of Fritz et al.

MPEP, at 2143.02, states that the prior art can be modified or combined to reject claims as obvious as long as there is a reasonable expectation of success. Given that both of the artisans express that any forms of cantilever deflection method would have been easily incorporated, it is clear that one of ordinary skill in the art of cantilever detection would have had a reasonable expectation of the success in incorporating well-known cantilever deflection detection methods, rendering the claims obvious over the cited references.

Even Applicants acquiesce this, wherein the instant specification states that an "artisan will realize that the detection technique discussed herein are exemplary and that ***any known***

technique for detecting deflection of a cantilever may be used" (page 11, [0033]), thereby further evidencing the reasonable expectation of success at such modification.

Therefore, for the above reasons, the invention as claimed is *prima facie* obvious over the cited references.

Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 1-10 and 31-33 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-10 and 31-34 of copending Application No. 10/254,201. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Examiner notes that claims 1-10 and 31-34 of the '201 application have been withdrawn from examination as being drawn to non-elected invention. However, the claims being prosecuted in the '201 application are drawn to a product and, if allowed, would be rejoined under *In re Ochiai* practice. Hence, the instant double patenting rejection is applied.

The steps involved in claims 1-10 and 31-33 of the instant application is identical to claims 1-10 and 31-34 of the '201 application.

Conclusion

No claims are allowed.

Inquiries

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Young J. Kim whose telephone number is (571) 272-0785. The Examiner is on flex-time schedule and can best be reached from 8:30 a.m. to 4:30 p.m. The Examiner can also be reached via e-mail to Young.Kim@uspto.gov. However, the office cannot guarantee security through the e-mail system nor should official papers be transmitted through this route.

If attempts to reach the Examiner by telephone are unsuccessful, the Primary Examiner in charge of the prosecution, Dr. Kenneth Horlick, can be reached at (571) 272-0784. If the attempts to reach the above Examiners are unsuccessful, the Examiner's supervisor, Dr. Gary Benzion, can be reached at (571) 272-0782.

Papers related to this application may be submitted to Art Unit 1637 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If applicant does submit a paper by FAX, the original copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office. All official documents must be sent to the Official Tech Center Fax number: (571) 273-8300. For Unofficial documents, faxes can be sent directly to the Examiner at (571) 273-0785. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1600.

Young J. Kim
Patent Examiner
Art Unit 1637
5/16/2005

YOUNG J. KIM
PATENT EXAMINER